iRZ automation

IRZ MC55i-485GI GPRS class 10 GSM modem

USER MANUAL

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1. Safety Requirements

Restrictions for the usage of the device in the vicinity of other electronic devices:

- turn off the modem IRZ MC55i-485GI in hospitals or in the vicinity of medical equipment (e.g. cardiostimulators, hearing aids). It can cause interference for medical equipment;
- turn off the modem in aircrafts. Take measures against accidental activation;
- turn off the modem in the vicinity of gas-filling stations, chemical enterprises, blasting work places. It can cause interference to technical devices;
- at a short range the modem may cause harmful interference to TV and radio receivers.

Prevent the modem from dust and moisture.

Improper use deprives you of all warranty claims.

2. General Information

2.1. Purpose of the Device

The modem IRZ MC55i-485GI is a structurally accomplished GSM modem designed for reception and communication of data, text messages and telecopies. It is excellently adjusted for industrial applications — telemetry, wireless data collection from sensors, remote monitoring and signaling.

The modem is assembled based on the GSM module MC55i Cinterion. The control is performed by means of standard AT-commands. The terminal is equipped with light-emitting diodes (LEDs) to monitor the status of connection.

2.2. Configuration

The complete set of the GSM modem IRZ MC55i-485GI:

- terminal IRZ MC55i-485GI,
- label,
- factory box.

2.3. Parameters

Basic parameters:

- frequency ranges: GSM 850/900/1800/1900 mHz;
- power output:
  - 2W (class 4 for EGSM900),
  - 1W (class 1 for GSM1800),
- GPRS class 10;
- TCP/IP suit available through AT commands;
- MC class B;
- CSD up to 14.4 kbps;
- USSD;
- SMS;
- fax group 3: class 1.

Electric power supply:

- power supply voltage from 9 to 25 V;
- absorbed current not more than:
  - with power supply voltage +12 V – 200 mA;
  - with power supply voltage +24 V - 100 mA.

Physical parameters:

- size not more than 76x85x30 mm;
- weight not more than 130 g.;
- operating-temperature range from -20°C to +65°C.

Interfaces:

- Connector RJ11 for power supply connection,
- Disruptive terminal connector for data cable connection (RS-485 and power supply connection),
- Connector SMA for GSM antenna connection.

Electric power supply can be fed to any of the two first connectors.

2.4. Exterior Appearance

The modem MC485 is a compact device made in a durable and lightweight aluminum housing. The exterior appearance is represented on Fig.2.4.1 and Fig.2.4.2.

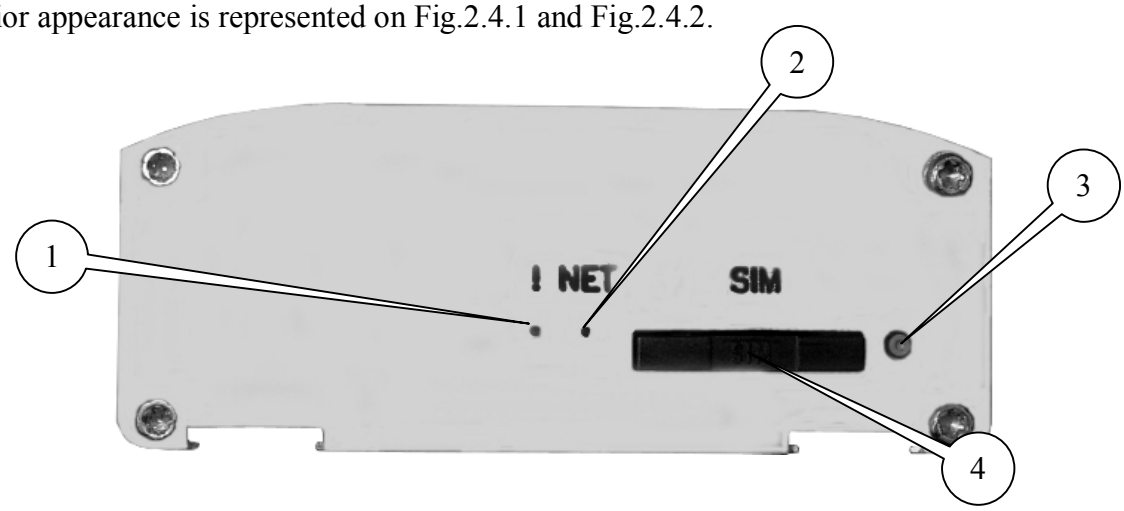

Fig.2.4.1 Front view

On the figures the digits mark the following:

1. Emergency LED indicator,
2. Network LED indicator,
3. SIM card tray extract button,
4. SIM card tray

2.5. Interfaces

2.5.1. Disruptive Terminal Connector

The connector is used for connection of electric power supply and of the control device, exchange protocol RS485.

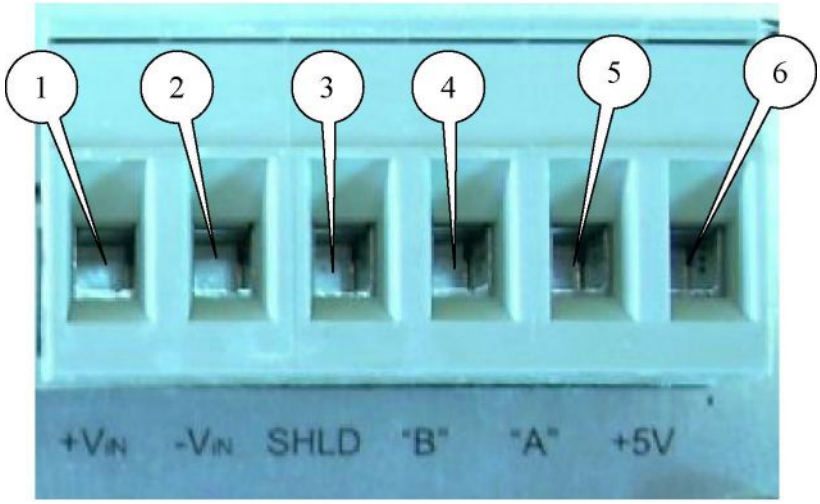

Fig.2.5.1 Disruptive terminal connector

Table 2.5.1 Purpose of the connector pins.

Connectors	Signal	Purpose
1	+Vin	"+" of the power supply source
2	-Vin	"-" of the power supply source
3	SHLD	"Screen" RS-485
4	"B"	"d-" RS-485;
5	"A"	"d+" RS-485;
6	+5V	"+5V" RS-485.

2.5.2. Connector RJ11 for Electric Power Supply Connection

The connector is used for connection of electric power supply.

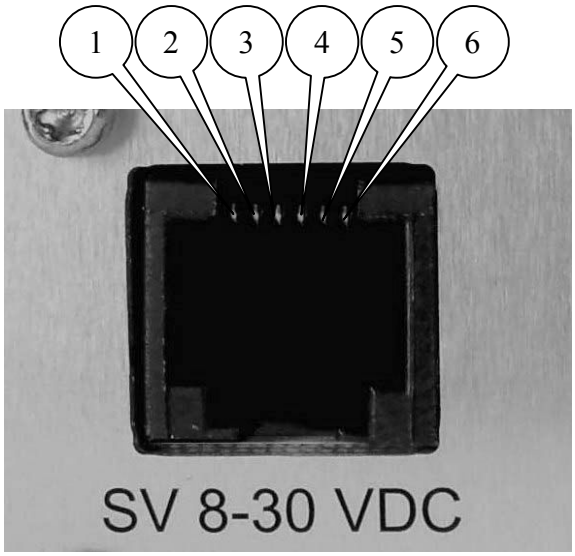

Fig.2.5.2 Connector RJ11

Table 2.5.2 Purpose of power supply connector pins.

Contact	Signal	Purpose
1	+ 12V	Positive pole of DC supply voltage. Protected with a fuse and the voltage-surge protection circuit (with voltage infeed rate more than 30V) and incorrect polarity.
2	not used	
3	not used	
4	not used	
5	not used	
6	GND	System casing

2.6. Modem Status Indication

Two LEDs are used for operating mode indication or for indication of emergency situations.

Table 2.6.1 Operating mode indication (green LED)

Indication mode	Operating mode
Turned off	Modem is turned off or there is an emergency situation
600 ms on / 600 ms off	Modem is not registered in the network
75 ms on / 3 s off	Modem is registered in the network
75 ms on / 75 ms off / 75 ms on / 3 s off	GPRS connection is installed
500 ms on / 50 ms off	Data transmission is underway
250 ms on / 10 s off	Modem is in the power standby mode, alarm-clock mode.
250 ms on / 250 ms off	Programming mode, menu mode

Table 2.6.2 Emergency situation indication (red LED)

Indication mode	Description of emergency
Continuously turned on	Input voltage invalid
0.5 s on / 0.5 s off	Power supply of the module invalid
0.25 s on / 0.25 s off / 0.25 s on / 1 s off	GSM module not started

3. Connection and Setting Up

3.1. Connection

Before feeding the power supply it is required to install the SIM card in the modem (the SIM card must be enabled). To do this, you need:

- to extract the SIM tray by pressing the SIM tray extract button (Fig.2.4.1);
- to install the SIM card into the SIM tray;
- to insert the SIM tray with the SIM card into the modem.

No strong physical efforts must be applied while installing the SIM card.

Connect the GSM antenna to the antenna connector as well as the commutating cable (RS485). Thereupon you need to feed power supply to the modem through the connector RJ11 (Fig.2.5.2) or the disruptive connector (Fig.2.5.1).

Note: GSM antenna, commutating cables and electrical power unit are not included in the complete set configuration.

After the power supply feeding, registration occurs automatically, which is signaled by the green indicator frequent flashing. After the registration is completed, the modem jumps to the operating mode, the green indicator flashes less frequently (Table 2.6.1).

3.2. Restarting and Power Off

The modem can be restarted in the following ways:

- restarting after a specified time period (WD interval, turned off on default), setting-up is made in the menu mode;
- by temporary power-off.

Power off of the modem can be carried out using the following ways:

- by the program method, using AT commands (escape to the power standby mode);
- directly by power-off.

After power-off made by means of AT commands, the modem escapes to the power standby mode (minimum power consumption). Escaping from the power standby mode is performed while turning-on of the GSM module by the alarm clock.

3.3. Menu Mode

The menu mode is designed to change the modem parameters and browse the statistics. In the menu mode the power supply of the GSM module is turned off, after escaping from the mode, automatic start occurs. You can jump to the menu mode from the operating mode. Before starting, connect the modem to the computer (rate is 115200 bit/sec, 8-N-1), feed the power supply to the modem, start the Hyper Terminal or a similar program to communicate with the modem. After extraction of the SIM tray (by pressing the SIM tray extract button), the modem will jump to the menu mode. Herewith the main menu is to be represented:

Menu mode:
Variant XX
<P1> Show statistics

<P2> WD interval = XXX hh (или “OFF”)
<PC> Power control
<PR> Clear statistic
where **Variant XX** is the weaving version.
The characters <…> signify the control commands. Input of the command gets underway after pressing “Enter”. In case of incorrect input, “ERROR” is indicated. There is no difference between the entered uppercase and lowercase characters.

After input of the command “P1” you jump to the statistics browsing menu:
Statistics:
Power_Modem = XX…X
Bad_Power_Modem = XX…X
Power_Module = XX…X
Bad_Power_Module = XX…X
Start_Module = XX…X
Bad_Start_Module = XX…X
Reset = XX…X
When the modem is used, the following situations are automatically saved:
Power_Modem – number of modem connexions,
Bad_Power_Modem – number of power supply deviations of the modem from the allowed value,
Power_Module – number of power supply feedings to the GSM module,
Bad_Power_Module - number of power supply deviations of the GST module from the allowed value,
Start_Module – number of successful GSM module starts,
Bad_Start_Module – number of situations where the GSM module did not start,
Reset – number of restartings.
After the statistics output, you will jump to the main menu.

After the input of the command “P2” you will jump to the WD menu:
WD interval, hh (hh=00 - WD off, max - 255)
<Q> Quit
WD interval =
In order to change the restarting interval, enter the number from 0 to 255 (input is after pressing «Enter»). The restarting interval is specified in hours. If you need to disable this function, enter 0. You should consider that after expiration of the specified time interval the modem will be restarted unconditionally. In case of incorrect input, the modem will indicate “ERROR” and represent the WD menu again. If the restarting interval is entered successfully, or the “Q” command is given, you will jump to the main menu.

After the input of the “PC” command – browsing of the input supply voltage and the module supply voltage (measurement accuracy 5%):
P0WER Uin=12.0 Umd=3.9
After the output you will jump to the main many.

After the input of the “PR” command – you will jump to the statistics clearing menu:
Clear statistic?
<YES> YES
<Q> Quit

The collected statistics is cleared by the command “YES”. In case of incorrect input, the modem will indicate “ERROR” and represent the statistics clearing menu again. In case of successful entering or input of the command <Q>, you will jump to the main menu.

After the input of the “M” command – the main menu will be loaded again.
You will escape from the menu mode after installation of the SIM tray.

4. Emergency Situations

To simplify the use of the modem, tracking of emergencies is provided.

4.1. Emergency 1 (input voltage invalid)

Emergency 1 occurs in case of deviation of the input power supply voltage from the allowed value. In such case the modem stops the operation: disconnects the power supply of the GSM module. It signals with the red LED about the emergency situation (turned on continuously). Escaping from the emergency situation is possible only after restoring of the input voltage.

4.2. Emergency 2 (power supply of the module invalid)

Emergency 2 arises in case of deviation of the power supply voltage of the GSM module from the allowed value. In such case the modem stops its operation: disconnects the power supply of the GSM module. It signals with the red LED about the emergency situation (0.5 s on / 0.5 s off). Escaping from the emergency situation is possible only after restoring of the power supply voltage of the module within 10 seconds from the time when the emergency situation occurred. If the power supply voltage of the module stays incorrect within 10 seconds (with correct input voltage), the modem jumps to the standby mode – the module power supply is disconnected, the emergency indication persists. Escaping from the standby mode is possible only after full disconnection of power supply.

In case of any repeated emergency after restarting of the modem, the modem is to be repaired.

4.3. Emergency 3 (GSM module not started)

Emergency 3 occurs in case where the GSM module is not started. Red LED signaling about the emergency situation: 0.25 s on / 0.25 s off / 0.25 s on / 1 s off. Escaping from the emergency situation is possible only after successful start of the GSM module. In case of 10 consecutive failed attempts to start the module (15 seconds), the modem jumps to the standby mode – the module power supply is disconnected, the emergency indication persists. Escaping from the standby mode is possible only with full disconnection of the power supply.

In case of any repeated emergency after restarting of the modem, the modem is to be repaired.